41

2613

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of | Atty. Docket

GERARD DE HAAN ET AL. | PHNL 010094

Serial No.: 09/855,628 | Group Art Unit: 2613

Filed: May 15, 2001 | Examiner: B.M. Senfi

Title: MOTION ESTIMATOR FOR REDUCING HALOS IN MC UP-CONVERSION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed is an amendment in the above-identified application.

[X] No additional fee is required.

[ ] The fee has been calculated as shown below.

CLAIMS AS AMENDED			
	Claims remaining after amendment / Highest number previously paid for	Number extra / Rate	Additional Fee
Total Claims	25 Minus 25 [1] =	X $18 =	$
Independent Claims	2 Minus 3 [2] =	X $86 =	$
Multiple Dependent Claims, if any. If not previously paid, $290.			$
Total Additional fee for this amendment =			$

[1] If less than 20, enter 20. [2] If less than 3, enter 3.

Please charge any fees which may be required, except the issue fee, or credit any overpayment to Deposit Account No. 14-1270.

Edward W. Goodman, Reg. 28,613
914-333-9611

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited this date with the United States Postal Service as FIRST CLASS MAIL in an envelope addressed to the COMMISSIONER OF PATENTS AND TRADEMARKS, P.O. Box 1450, Alexandria, VA 22313-1450.

on Oct. 4 2004

Burnett James

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of | Atty. Docket

GERARD DE HAAN ET AL. | PHNL 010094

SERIAL NO.: 09/855,628 | GROUP ART UNIT: 2613

FILED: May 15, 2001 | EXAMINER: B.M. Senfi

MOTION ESTIMATOR FOR REDUCING HALOS IN MC UP-CONVERSION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

RESPONSE UNDER 37 C.F.R. 1.111

This is in response to the Office Action mailed August 4, 2004, in which the Examiner rejected claims 1-6, 13-18 and 25 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,594,313 to Hazra et al.; and claims 7-12 and 19-24 under 35 U.S.C. 103(a) as being unpatentable over Hazra et al. in view of U.S. Patent 6,480,615 to Sun et al.

Applicants traverse the above rejections and offer the following explanations.

The Hazra et al. patent discloses increased video playback framerate in low bit-rate video applications in which an interpolated frame intermediate of a frame pair is synthesized based on a variety of methods. As stated at col. 1, lines 48-67:

> "In another embodiment, a method includes maintaining a number of lists, wherein each list

contains a current winning block, for a number of interpolated blocks of an interpolated frame for determining a best-matched block from a frame pair for each interpolated block. Additionally, the best-matched block for each interpolated block is selected from the current winning block for each list based on an error criterion and an overlap criterion. The interpolated frame is synthesized based on the best-matched block for each interpolated block.

"In another embodiment, a method includes selecting a zero motion vector for a given pixel in an interpolated frame upon determining a current pixel in a current frame corresponding to the given pixel in the interpolated frame is classified as covered or uncovered. The interpolated frame is synthesized based on selecting the zero motion vector for the given pixel in the interpolated frame upon determining the current pixel in the current frame corresponding to the given pixel in the interpolated frame is classified as covered or uncovered."

The subject invention, as claimed in claim 1, concerns the detecting of motion at a temporal intermediate position between previous and next images, in which the method comprises optimizing a criterion function for candidate vectors, said criterion function depending on data from both previous and next images, the optimizing being carried out at the temporal intermediate position in non-covering and non-uncovering areas. In particular, the optimizing is carried out "at the temporal position of the next image in covering areas and at the temporal position of the previous image in uncovering areas."

Applicants submit that while Hazra et al. mentions the terms "covered" and "uncovered", there is no disclosure in Hazra et al. "that the optimizing is carried out at the temporal position of

the next image in covering areas and at the temporal position of the previous image in uncovering areas." Rather, Hazra et al. selecting "a zero motion vector for a given pixel in an interpolated frame upon determining a current pixel in a current frame is classified as covered or uncovered." In fact, there is no disclosure in Hazra et al. that the temporal position in the previous image is even considered.

With regard to claim 3, while Hazra et al. discloses that "the selection criterion from among the three candidates…uses both the block matching error…and the overlap to choose the best motion vector", Applicants submit that there is no disclosure that the "criterion function is a match error **which is minimized**." (emphasis added).

The Sun et al. patent discloses motion estimation within a sequence of data frames using optical flow with adaptive gradients. While Sun et al. "mentions" the terms "occlusions" and "edge" (at col. 3, lines 5-50), Applicants submit that Sun et al. neither shows nor suggests determining a velocity edge, marking an occlusion area around the determined edge, and replacing the foreground velocity by background velocity or reversibly dependent on whether the occlusion are a is a covering or uncovering area, the sign of the foreground velocity and on which side of the velocity edge the foreground is (as claimed in claim 7).

Furthermore, Applicants submit that Sun et al. does not supply that which is missing from Hazra et al., i.e., "that the optimizing is carried out at the temporal position of the next image in covering areas and at the temporal position of the previous image in uncovering areas."

In view of the above, Applicants believe that the subject invention, as claimed, is neither anticipated nor rendered obvious by the prior art, either individually or collectively, and as such, is patentable thereover.

Applicant believes that this application, containing claims 1-25, is now in condition for allowance and such action is respectfully requested.

Respectfully submitted,

by _____
Edward W. Goodman, Reg. 28,613
Attorney
Tel.: 914-333-9611

CERTIFICATE OF MAILING

It is hereby certified that this correspondence is being deposited with the United States Postal Service as First-class mail in an envelope addressed to:

COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

On Oct. 4, 2004

By Burnett Jones